

US PTO Customer No. 25280
Case No. 2056B

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Express Mail Label No.: EL 992172746 US

IN THE CLAIMS

Please cancel the claims set forth in the application, and substitute instead the following claims for prosecution:

10. An inflatable airbag cushion having multiple fabric layers and closely spaced interconnected woven in joints that resist gas permeation, comprising:

(a) a first woven fabric layer and a second woven fabric layer, said first and second woven fabric layers each having a plurality of yarns running in the weft direction and a plurality of yarns running in the warp direction,

(b) a first interconnected joint and a second interconnected joint, said first and second interconnected joints running generally parallel and in the warp direction, said first and second interconnected joints each forming a woven union of said first and second woven fabric layers along the length of said interconnected joints, the number of yarns running in the warp direction between said first and second interconnected joints being no more than about twelve yarns in said first layer and no more than about twelve yarns in said second layer;

(c) at least some of said weft yarns comprising crossover yarns, said crossover yarns of said first layer switching from a position within said first layer to a position within said second layer at said first interconnected joint, said crossover yarns further switching from a position within said second layer to a position within said first layer at said second interconnected joint; and

(d) wherein said crossover yarns are substantially free of floats at said interconnected joints.

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11. The airbag cushion of claim 10 wherein the number of yarns extending in the warp direction between said first and second interconnected joints is between about 2 and 12 for each of said layers.

12. The airbag cushion of claim 10 wherein the number of yarns in the warp direction between said first and second interconnected joints is no more than about eight yarns for each of said layers.

13. The airbag cushion of claim 12 wherein the number of said yarns in said warp direction between said joints is between about 2 and about 4 yarns for each of said first and second layers.

14. The airbag cushion of claim 10 wherein said crossover yarns are provided in a plain weave configuration that extends across said joints.

15. The airbag cushion of claim 10 wherein in the weft direction each of said crossover yarns passes alternately over and under each of said successive warp yarns in each of said joints.

16. The inflatable airbag cushion of claim 13 wherein said crossover yarns are provided in a plain weave.

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17. An inflatable airbag cushion having multiple layers and closely spaced interconnected woven in joints that resist gas permeation, comprising:

(a) a first woven fabric layer and a second woven fabric layer, said first and second woven fabric layers each having a plurality of yarns running in the warp direction and a plurality of yarns running in the weft direction,

(b) a first interconnected joint and a second interconnected joint, said first and second interconnected joints running generally parallel and in the weft direction, said first and second interconnected joints each forming a woven union of said first and second woven fabric layers along the length of said interconnected joints, the number of yarns running in the weft direction between said first and second interconnected joints being no more than about twelve yarns in said first layer and no more than about twelve yarns in said second layer;

(c) at least some of said warp yarns comprising crossover yarns, said crossover yarns of said first layer switching from a position within said first layer to a position within said second layer at said first interconnected joint, said crossover yarns further extending from a position within said second layer to a position within said first layer at said second interconnected joint; and

(d) wherein said crossover yarns are substantially free of floats at said interconnected joints.

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18. An inflatable airbag cushion having multiple layers and closely spaced interconnected woven in joints, comprising:

(a) a first woven fabric layer and a second woven fabric layer, said first and second woven fabric layers each having a plurality of first yarns extending in a first direction and a plurality of second yarns extending in a second direction, said second direction being perpendicular to said first direction,

(b) a first interconnected joint and a second interconnected joint, said first and second interconnected joints extending generally parallel and in the first direction, said first and second interconnected joints each forming a woven seam joining said first and second woven fabric layers along the length of said interconnected joints, wherein the number of first yarns extending in the first direction positioned between said first and second interconnected joints is between about two and twelve yarns in each of said first and second layers,

(c) said second yarns alternating from a position in said first layer to a position in said second layer, further wherein said second yarns are provided in a plain weave, said plain weave being maintained across each of said interconnected joints.

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19. The inflatable airbag cushion of claim 18 wherein the number of first yarns running in said first direction between said first and said second interconnected joints is between about two and about eight yarns for each of said layers.

20. The inflatable airbag cushion of claim 19 wherein the number of said first yarns is between about two and about four yarns.

21. The inflatable airbag cushion of claim 19 wherein said woven in joints are made on a dobby loom.

22. The inflatable airbag cushion of claim 21 wherein said first and second layers are essentially independent of each other, said first and second layers being generally free from yarn interconnections at locations which are between said first and second interconnected joints.

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23. An inflatable airbag cushion comprising a woven fabric of dobby construction, said fabric comprising an inflating portion and a non-inflating portion, wherein said airbag comprises woven in joints, comprising:

(a) a first woven fabric layer and a second woven fabric layer, said first and second woven fabric layers each having a plurality of first yarns running in a first direction and a plurality of second yarns running in a second direction, said second direction being perpendicular to said first direction,

(b) a first interconnected joint and a second interconnected joint, said first and second interconnected joints running generally parallel and in the first direction, said first and second interconnected joints each forming a woven seam joining said first and second woven fabric layers along the length of said interconnected joints, wherein the number of first yarns running in the first direction positioned between said first and second interconnected joints is between about two and twelve yarns for each of said first and second layers, and

(c) said second yarns alternating from a position in said first layer to a position in said second layer, further wherein said second yarns are provided in a plain weave, said plain weave being maintained by said second yarns across said interconnected joints.

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24. An inflatable airbag cushion comprising a woven fabric of jacquard construction, said fabric comprising an inflating portion and a non-inflating portion, wherein said airbag comprises woven in joints, comprising:

(a) a first woven fabric layer and a second woven fabric layer, said first and second woven fabric layers each having a plurality of first yarns running in a first direction and a plurality of second yarns running in a second direction, said second direction being perpendicular to said first direction,

(b) a first interconnected joint and a second interconnected joint, said first and second interconnected joints running generally parallel and in the first direction, said first and second interconnected joints each forming a woven seam joining said first and second woven fabric layers along the length of said interconnected joints, wherein the number of first yarns running in the first direction positioned between said first and second interconnected joints is between about two and twelve yarns for each of said first and second layers, and

(c) said second yarns alternating from a position in said first layer to a position in said second layer, further wherein said second yarns are provided in a plain weave, said plain weave being maintained by said second yarns across said interconnected joints; and

(d) wherein said interconnected joints are provided in a curved format in a jacquard weave.

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25. An inflatable airbag cushion having closely spaced woven in joints, comprising:

(a) a first woven fabric layer and a second woven fabric layer, said first and second woven fabric layers each having:

i) a plurality of first yarns running in a first direction and
ii) a plurality of second yarns running in a second direction, wherein said second direction is perpendicular to said first direction;

(b) a first joint and a second joint, said first and second joints extending generally parallel and in said first direction, said first and said second joints comprising regions of yarn entanglement which associate said first and second woven layers to each other, wherein between about 2 and about 12 generally parallel first yarns are provided in said first direction between said first and second joints for each of said layers, thereby forming a relatively small distance between said first and second joints, said relatively small distance contributing to the gas impermeability of said inflatable airbag cushion; and

(c) wherein at least some of said second yarns are provided in a plain weave pattern, said plain weave pattern extending across said first and second joints.

26. The airbag cushion of claim 25 wherein said second yarns form a seam along said joint, wherein said second yarns pass successively over and under each transversely oriented first yarn such that the over-under interwoven relationship between said first yarns and said second yarns is maintained across said first and second joints, further wherein said second yarns shift from one of said first layers or said second layers, to the other, upon passage or shifting of said second yarns across one of said joints.

27. The airbag cushion of claim 26 wherein said passage or shifting of said second yarns occurs within the space of a single transversely oriented first yarn.

28. The airbag cushion of claim 26 wherein said cushion is substantially free of floats.

29. The airbag cushion of claim 25 wherein between about two and about eight first yarns are provided in said first direction between said first joint and said second joint for each of said layers.

30. The airbag cushion of claim 29 wherein four first yarns are provided in said first direction between said first and second joints.

31. An inflatable airbag cushion comprising a fabric having woven in joint seams with substantially float-free yarn construction along the woven in joint seams, comprising:

(a) a first woven fabric layer and a second woven fabric layer, said first and second woven fabric layers being interconnected to each other, each of said first and second layers having:

- i) a plurality of first yarns extending in a first direction and
- ii) a plurality of second yarns extending in a second direction, said first and second yarns being woven together;
- iii) said second direction being perpendicular to said first direction;
- iv) wherein at least some of said second yarns are shared between said first layer and said second layer;

(b) a first joint and a second joint, said first and second joints extending generally parallel and in said first direction, said first and said second joints comprising regions of yarn interconnection and crossover between said first and second woven layers, wherein between about 2 and about 12 generally parallel first yarns are provided in said first direction between said first and second joints in each of said layers; and

(c) said second yarns being positioned within both of said first and said second layers, said second yarns forming a crossover from one of said first and second layers to the other of said layers at said joints, further wherein said crossover is provided such that said second yarn assumes a plain weave pattern; wherein in said crossover and

across said joint said second yarns pass alternatively over and then under successive first yarns, thereby forming a substantially gas impermeable seam at said joints.

32. The inflatable airbag cushion of claim 31 wherein said seams of said cushion are formed of jacquard construction.

33. The inflatable airbag cushion of claim 32 wherein said seams are curved.

34. The inflatable airbag cushion of claim 31 wherein a plurality of joints are provided along said first direction, further wherein the number of first yarns between successive joints is between about two and about eight for each of said layers.

35. The inflatable airbag cushion of claim 34 wherein the number of first yarns between successive joints is between about two and about four for each of said first and second layers, thereby providing a total of between about four and about eight first yarns between successive joints for the first/second layer structure.